

Summary of the Review and Analysis of Existing International and European Union Regulations for Open Educational Resources (OER).

The digital transformation in recent decades has affected all areas of society, including education. Teachers have access to more and more different digital teaching and learning materials from various sources, many of which are free and freely available. This increased offer goes hand in hand with questions about the quality of freely available open educational resources (OER) and the call for improved access to high-quality open educational resources.

However, a number of challenges arise in connection with the increased establishment of OER:

- **Access and handling.** Many teachers lack adequate knowledge of digital media, which makes it difficult for them to access and use OER, taking license issues into account.
- **Quality assessment.** Establishing universal quality standards for OER is challenging due to their diversity and the need to accommodate individual needs.
- **Inclusion and accessibility** remain an ongoing challenge when it comes to evaluating the potential of OER for use with diverse groups of learners and assessing materials in terms of their usability for different groups of students.
- **Collaboration among stakeholders** is vital to establish a cooperative process that makes OER (re)usable and easily accessible through repositories and network creation.

The growing adoption of digital technologies, including those based on artificial intelligence (AI), and the mere making available of OER are not enough to reduce inequality, strengthen equal opportunities and promote fairer education systems. It is crucial how the available digital resources are used, and which ones are selected, which goes hand in hand with questions about the quality of digital technologies and OER and their usability, especially in inclusive contexts.

Recent studies indicate a deficiency in research on quality assessment of OER. UNESCO emphasizes the need to establish evidence-based standards for the quality assurance of OER and to align them to the UN 2030 Agenda and SDG 4 (Quality Education). Hashey et al. (2021, p. 3) highlight in this context that providing curriculum-related materials that are suitable for and accessible to students with sensory, physical, learning, and cognitive disabilities is both a civil right and an educational obligation.

In summary, although OERs have the potential to increase equal opportunities in education, accessibility, quality, and inclusivity of OER are still insufficiently addressed in research and practice. The EQui-T project is therefore dedicated to this issue and the present report constitutes a milestone in this project.

Summary of Quality Assurance literature for Open Educational Resources (OER)

1 In Search of a Model for Assessing the Quality of Inclusive and Accessible OERs.

In order to analyze the instruments used for quality assurance of OER and to specify the role of accessibility and inclusion in this context, a literature review was carried out. The aim was to obtain an overview of relevant literature on quality and quality assessment of OER, taking into account the different perspectives of stakeholders (students, teachers and researchers).

Of the approximately 100 papers selected, 72 focused on the topic of OER quality and the others on various general concepts related to OER. Of these 72 articles, only 48 mentioned inclusion and/or accessibility, although only 11 of these explicitly addressed accessibility criteria and 18 included inclusion/inclusivity. However, accessibility was often addressed in relation to websites or platforms that contain OER. When referring to inclusion, it became apparent that this topic is often only considered very cursory, for example by pointing out that resources should be inclusive, without further specification.

Inclusion ensures equal access to opportunities and resources for marginalized groups, emphasizing the importance of accessible educational materials. Over the years, the term of inclusion has shown an expansion beyond the focus on people with disabilities. Inclusion in the broader sense encompasses a wide range of dimensions, such as cultural inclusivity, language diversity, and socioeconomic factors.

Initial discussions (2011-2016) focused primarily on accessibility for students with disabilities and the need for technological accessibility. Key contributions highlighted the importance of criteria for evaluating OER accessibility and proposed models for quality assessment.

During 2017-2019, research focused increasingly on social and cultural relevance, equity, and accessibility. Universal Design for Learning (UDL) and web accessibility guidelines were emphasized. Recommendations for creating inclusive OER and policies were proposed.

Recent publications promote a more comprehensive approach to OER, incorporating multiple dimensions of diversity such as:

- **Accessibility:** Designing resources to meet the diverse needs of students with disabilities.
- **Cultural and Linguistic Diversity:** Creating OER taking into account different perspectives and multiple languages.
- **Socio-economic Inclusion:** Bridging the digital divide and ensuring free access to resources.
- **Gender:** Promoting gender equality and avoiding stereotypes.

Other topics identified in the literature that relate to inclusion are:

- **Universal Design for Learning (UDL):** Designing resources for the widest range of learners.
- **Assistive Technologies:** Using technologies like screen readers, captioning and alternative input devices.

The perception of OER has changed significantly over the past decades, particularly concerning their didactic aspects and quality assurance. Initially, OER were seen as tools to assist teachers in various functions, such as introducing new topics, reinforcing skills, and providing learning activities. However, quality assurance received little attention in early discussions.

It is in the early years of the 2010s, when OER are posited as a quality method to ensure the open and participatory approach that education is adopting. Both Ehlers and Conole (2010) and Achieve Inc (2011) emphasize the impact of OER in transforming the traditional educational paradigm towards a process in which students also become producers, and teachers actively engage in a process of feedback. Thus, the need to evaluate the quality of the resources used begins to be considered, initially through evaluation criteria covering aspects such as alignment with standards, quality of assessment, technological interactivity, instructional exercises, opportunities for deeper learning, and accessibility assurance.

In recent years, the relationship between OER and inclusive education has been explored and frameworks were developed in order to evaluate OER based on dimensions like purpose, ease of use, content, and pedagogical implementation. The application of Universal Design for Learning (UDL) principles has been advocated to enhance the benefits of OER. Best practices were also identified and a reflection on theoretical principles underlying quality assurance occurred.

Recent contributions (2015-2023) emphasize the relevance of metadata, the consideration of students' emotions, and the importance of inclusive approaches. UNESCO and other organizations provided guidelines for developing systematic and effective OER policies.

Overall, the results of this literature review highlight the need for accessible, inclusive and high-quality design of OER in order to meet the diverse needs of learners and educators.

2 Models and frameworks for the Evaluation of the Quality of OER

Scientific articles, anthologies, and institutional documents related to frameworks, checklists, or evaluations of the quality of inclusive and accessible open educational resources (OER) were further analysed. The main objectives are to offer a current state of the art on these frameworks and to extract recommendations and good practices for creating inclusive and accessible OER.

The analysis covers various frameworks and models for quality assurance, focusing on accessibility and inclusion. The frameworks are categorized based on their semantic structure, the information they evaluate, and their evaluation methods. Recommendations are grouped into dimensions and sub-dimensions, forming a multidimensional model for assessing the quality of OER.

The reviewed frameworks are analyzed based on several characteristics, including authors, publication year, framework name, dimensions and criteria, checklists, rating scales, intended audience, context of application, educational level, and validation status. It became apparent that the frameworks cover different educational levels and have evolved over time, addressing various aspects of OER quality. The following central frameworks were identified in the field of quality assessment of OER:

- Learning Object Evaluation Instrument (LOEI) (Haughey & Muirhead, 2005)
- Learning Object Review Instrument (LORI) (Nesbit et al., 2007)
- Rubric for Evaluating Open Education Resource (Achieve Inc., 2011)
- Quality Assurance Guidelines for Open Educational Resources: TIPS Framework (Kawachi, 2014)
- Instrument for Quality Assurance of OER (IQOER) (Zawacki-Ritchter & Mayrberger, 2017)
- Multimedia Educational Resources for Learning and Online Teaching (MERLOT Rubric) (California State University, 2019)

Since 2014, new frameworks have focused on specific types of OER, such as MOOCs, OCWs, web-based learning environments, and open textbooks. Accessibility has become a key consideration, incorporating WCAG guidelines and UDL principles (Romero Peláez & Morocho Yunga, 2016; Monsalve Ríos et al., 2018; CREA Project, 2019; Chimbo et al., 2021).

The Models and frameworks analyzed draw on dimensions, sub-dimensions, criteria, indicators, and items to assess the multidimensional nature of OER quality. The most frequently mentioned dimensions include:

- content quality
- learning objectives,
- motivation,
- presentation design,
- accessibility, usability, metadata, licenses,
- diversity.

Checklists often use Likert scales, Yes/No options, and fields for comments.

Of the 48 articles reviewed that focused on the concept of framework, only 16 reported on the validations of their frameworks, mainly using questionnaires, UX tests, and interviews. While some frameworks were validated by users or experts, others relied on existing instruments or tools. During the validation process, the relevance of accessibility, usability, and pedagogical quality were particularly highlighted.

The term *Inclusion* is mentioned in 18 reviewed publications, whereby particularly the dimensions gender, language, culture, race/ethnicity, socio-economic status, age, and disability or specific educational needs were taken into account. At this point, reference should also be made to frameworks like those of Haughey and Muirhead (2005), Sreedher (2009), and UNESCO (2016, 2019), which provide comprehensive recommendations for inclusive OER.

In addition, *accessibility* is mentioned in the majority of the 48 publications examined and thus emerges as a factor for assessing the quality of an OER. In 11 of these publications, the authors refer to accessibility in terms of either the ease of finding and downloading OER or the fact that the OER is free or inexpensive. However, it should be noted that according to the understanding of OER as defined by UNESCO (2019), even low costs contradict the basic idea of OER.

With regard to the literature analysis, the *accessibility* of OER is mentioned, recommended or listed as a question in the checklist only in 11 publications. However, the remaining publications (a total of 26 articles) contain specific questions or recommendations that address accessibility, such as compliance with WCAG standards, the use of alternative texts, subtitles and assistive technologies. Recent publications (2017-2023) in particular emphasize the need to make OER accessible to learners with different needs.

In conclusion, this literature review underscores the importance of multidimensional models, validation processes, and the integration of new technologies to ensure high-quality, inclusive, and accessible OER.